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# THE BRYOLOGIST.

VOL. V.

MAY, 1902.

No. 3.

## SUN PRINTS IN BRYOLOGY.

DR. RODNEY H. TRUE.

During the past ten years the writer has been engaged in the study of the genus *Dicranum*, and, in casting about for some method of illustrating a contemplated paper on the subject, has experimented with a number of methods. Special difficulty has been encountered in finding some method of placing before the reader an accurate representation of the general habit of the plant. The somewhat costly service of the professional artist, while satisfactory in many respects, was found to present financial obstacles.

At length it occurred to him that perhaps the method described by Dr. Halsted, under the name of Solandi process of printing, applied by him to leaves of flowering plants, might here be capable of adaptation. The anticipation proved well founded, and at the suggestion of the editors of THE BRYOLOGIST, the writer has presented here a brief statement of the method as used by him, and also illustrations (Plate IV, and Fig. A.), which will serve to indicate the kind of results obtained.

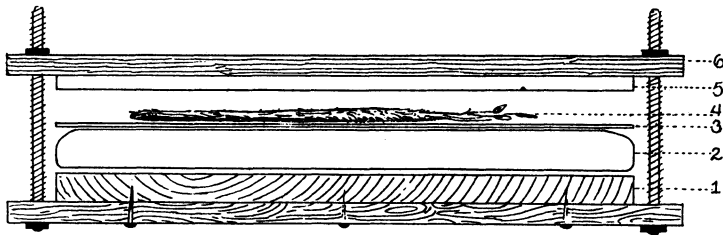


FIG. A.

1. Board at back nailed to frame.
2. Pad of cotton covered with tissue paper.
3. Sheet of photographic paper.
4. Moss.
5. Piece of glass.
6. Frame.

The method may be described briefly. The moss to be used should be carefully chosen and prepared for the purpose. The tuft should not be so thick as to wholly exclude light. The individual plants should be readily distinguished. This tuft, dried under considerable pressure, is laid upon the surface of some smooth sensitive paper, (solio is good,) and pressure applied sufficient to give a close contact. This is obtained by the writer in the following manner: A board of proper size, (Fig. A.) perhaps six inches by four inches, furnishes a solid backing (1). On this is laid a pad, made by

The March BRYOLOGIST was issued March 1st, 1902.

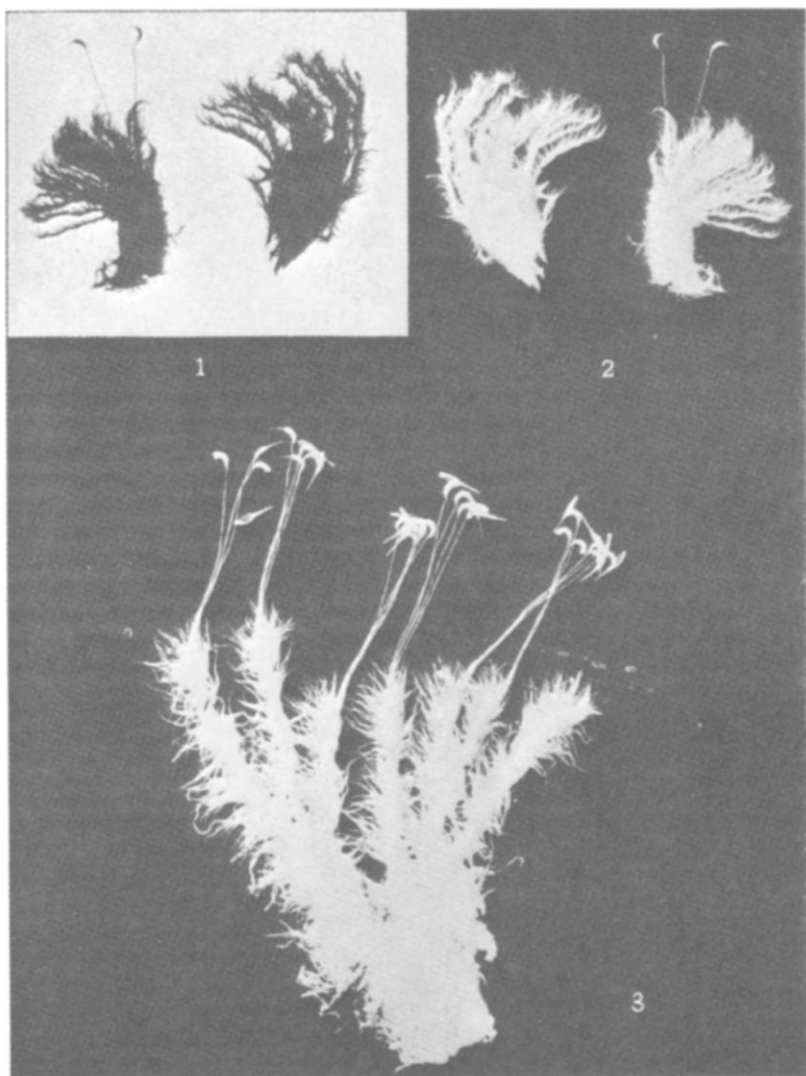


PLATE IV.

1. Positive print of *Dicranum falcatum* Hedw.
2. Negative print of same specimen used in preparing figure 1.
3. Negative print of *Dicranum undulatum* Ehrh.

covering a properly formed body of loose absorptive cotton with the thinnest rice tissue paper (2). On top of the pad is laid the sensitive paper (3), of course face up. On this follows the moss (4), and over all a piece of thin (one-fourth inch) plate glass, very carefully cleaned (5). By means of a framework, which passes across ends of the glass (6) and bolts with nuts, the board at the back and the glass are drawn closely together. By tightening the nuts sufficiently with a bicycle wrench, a very close contact may be obtained. The apparatus is then placed in the sun, great care being taken that the glass intercepts the rays of light at exactly right angles.

The printing is allowed to go on until a sufficiently sharp print of the moss is made on the solio paper. Some care is necessary at this stage, since over-exposure leads to the "printing out" of the thinner parts of the plant and a consequent obscuring of the form of the more delicate parts. By a little practice one is able to decide just how long a given specimen should be printed. This is a matter which concerns the individual specimen, and no two subjects can be treated exactly alike.

After the print has been made, the usual toning and fixing takes place, the result being a negative print. In order to obtain a positive print, this negative may be soaked in some clearing agent (the writer usually uses kerosene) and used as a negative, as if it were a glass negative. Of course, care must be taken to avoid a surplus of kerosene. Thus from the paper negative any number of positive prints may be made.

As will be readily seen, this method is adapted for the reproduction of labels, autograph notes, plates, and anything which is printed on but one side of the paper. The writer has found this method extremely useful in reproducing plates from rare works and in multiplying drawings of various structures or other features desired. Some may choose the positive print, in which case, as is usual in illustrations, the object appears dark against a light background. (Plate IV. 1). The writer, however, prefers the negative print as having greater sharpness. (Plate IV. 2 and 3)

The accompanying plate illustrates the two types of prints, and it will be noted that, while the positive print reminds one of the usual illustrations more strongly than does the negative print, the latter is perhaps a trifle sharper in its details.

As the reader will observe, this method is capable of adaptation in almost an endless number of ways, and will be found applicable not only to solio paper but also to blue-print paper, and other kinds of printing paper. It is extremely useful as furnishing to the worker a rapid method of making an accurate record of the habit and size of rare specimens which he may be able to see occasionally. It is perhaps as a means of making such a record that this method finds its greatest usefulness to the working bryologist.

Should readers of *THE BRYOLOGIST* desire further information than this outline sketch furnishes, the writer would be very glad to communicate with any such and explain further such points of difficulty, as he may be able.

*Bureau of Plant Industry, Washington, D. C.*